Policy Frameworks for the Knowledge Based Economy: ICTs, Innovation and Human Resources.
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Abstract

1. This paper has three parts. In the first, it throws light upon the economics of innovation beginning from Schumpeter up to the present time. The main message is that innovation is a key issue to produce economic wealth. But this is not without creating ups and downs in society using market economics and being liberal democracy .In the second, the global village's wealth in the long run is highlighted, giving a world's legitimacy to the concern for innovation. In the third, a new way of thinking is proposed. It is a way to capitalise on a wider spectrum of knowledge than today through market economics. Indeed, this new theory looks at the full stage of development a society has due to its state of civilisation at a certain moment of time. This seems to be more relevant when markets are open and more interactive than in the past. The new knowledge policy is a way to provide new and more shared growth than in the past.

Departing from Schumpeter

2. There has always been concern for innovation to produce growth, to satisfy needs and to diffuse income in economies using market economics and enjoying liberal democracy. Everyone will remember **Schumpeter**, the great Austrian economist from the beginning of the XX Th century, writing clearly that technical innovation promoted by private entrepreneurs is a key issue in this respect. He also put emphasis on duplication once an innovation has occurred. Keeping in mind both processes and their timing, he said that under their forces and entrepreneurship economies change basically in terms of economic activities and required skills to be successful. Therefore, he indicated that **there is a process of wealth creation and destruction, which features liberal and democratic societies because of innovation. As such Schumpeter indicated also that technical innovation creates ups and downs in these societies since wealth is in intricacy with all that a society offers for its citizens to live**. Since Schumpeter, analysts of innovations and economists have tried to throw light on the parameters of these shocks. They agreed mentioning macro and micro performances at the time at which an innovation occurs and also during its "spread-out" like the spectrum of its applications, the accompanying framework and in this respect the culture of change featuring in the society. In the latter case, they also mentioned entrepreneurship. Indeed, coming back to Schumpeter there are innovations because there are entrepreneurs even accounting for public support to innovation.
3. Since Schumpeter, economists and analysts have given greater attention to technical innovations though this was not easy because of data problems. Indeed, long term and detailed statistics were needed, for example, to identify waves of innovations, major innovations, their accompanying conditions, their effects, constraints and so on. They have also looked at the duplication process. Much

work has been done at OECD directly but also indirectly through communication and information processes about works mainly from academics. During the nineties, the concern for employment and profit led OECD, more precisely its DSTI, to launch a project trying to define what would be the best global framework for technical innovation, accompanied by selected synergies. For example to get growth with increased employment and productivity. An interesting conclusion was that governments should favour a systemic approach to technical innovation. This means they should focus on the intricacy of their global policies in terms of content, timing, regulation and co-ordination rather than focusing only on some selected policies and trying to fine tune these ones as strongly as possible. Works done on SMEs by OECD gave support to this conclusion. Indeed, this is a way to account for public support towards technical innovation being decentralised in many countries and also to focus on SMES, which are the major part of the set of enterprises everywhere. Gradually economists have also looked at non-technical innovations. First, because economic history indicated they are amongst the accompanying conditions to technical innovations. Second, because they featured the finance sector which has become a dominant operator on markets since the beginning of the eighties up to now. And third, because the global age requires various changes or innovations to accommodate globally to its various downturns.

4. Some researchers have also tried to discover factors, which might change the nature of innovation. Indeed, economic history shows that it comes and it goes. It is largely a random process though there are waves of innovation and natural trajectories i.e. innovations naturally giving birth to other ones. In this case, the U.S. performances have been exemplified very often. This was a fortiori the case when in the recent past the U.S. enjoyed a long period of growth compared to other industrialised countries. In this respect, all countries have tried to discover and promote best practices from the U.S. This has helped OECD like the EU to seek for best practices coming from each country ‘s learning process towards innovation. Normally, this would lead OECD i.e. DSTI to refine its previous global framework to innovation. Indeed, a wide benchmarking exercise towards innovation and growth is part of DSTI ‘s work programme for this year and the next.
5. It is worth indicating that at the end of the nineties the emphasis on SMEs has led researchers to focus on linkages needed to get innovative firms. Indeed, the global age is not only featured by market economics spreading out all over the world or nearly. It reveals also a change in the nature of the growth process. It is no more physical investments which matter, like in the past to achieve potential output. It is the intangible ones, which rocket. So, one has to invest in human capital, i.e. education and training, R&D, PC’s and software, in addition services of excellence to enterprises. These references are the elements of the most accepted definition of intangibles. They feature the rise of a new age called “the knowledge” by some people. With it, not only is there a change to the nature of the growth process but also it is accompanied by a change of speed at which innovation occurs. In the past, the timing of diffusion was that of innovation (technical mainly) getting mature. The diffusion time was also the period needed to refine it so as to get the best fit to needs. That was how to get the full advantage of innovation and therefore its global profits. What is important in that case is the demand elasticity to income. All that has changed. Innovations are now put on markets as quickly as possible. Indeed, the first one tends to be the

winner. This means, it would have the best chance to capture a maximum profit in the short run. In this case, what matters is the demand elasticity to price whatever is the degree of fitting of innovation to needs. But as indicated by W.J. Baumol from Princeton University in a new book (published by Princeton University Press this year) entitled « The Free Market Machine » the one who is the more able to master innovation gets the best protection against competition. Why? Just because he is always able to redefine the path of competition on which the other ones have to run. To master innovation means to have the knowledge featuring its core. This is the real competitive advantage in the long run. This is one of the best strategies to survive when the pace of innovation increases, as it has been the case since slightly more than a decade. Indeed, this strategy is particularly appropriate when innovation has become a routinized activity and therefore its profit a non-accidental result. In this case supply is much more elastic to private capital gains than in the past.

6. The preceding leads us to focus on what could be the creative potential of firms and societies. One ceases to look at innovation i.e. the result of some decisions and resource allocations in favour of what might be some innovation culture. The spread out of ICTs has already delivered the same message. Indeed, after Solow saying and repeating that « computers are everywhere except in the national accounts statistics, for example in the productivity data », there have been many efforts to measure results of ICTs' spread out. This was particularly the case for productivity. Total factor productivity and labour productivity were measured for ICTs production and consuming sectors compared to the rest of the economy and on average also. Yes, a positive answer was given at least for labour productivity but in the framework of global measurement difficulties. And therefore a doubt has remained. In that framework, some people from the business community have strongly emphasised **a cultural change to work to get a robust trend of productivity increase with ICTs**.What that means has not really been investigated up to now. But it is clear that it goes far beyond a lonely ad hoc recruitment. Indeed, evidence favourable to productivity changes both in the Us case and in the European one have featured firms which have re-designed their global organisation, but not only. We will be come back on this crucial point after the following section about wealth at long run in the global village.

Long term Wealth in the global village

7. **Why come back on innovation when considering global issues? First, to get growth and be able to share its results amongst people everywhere in the global village. Second, to master the ups and downs as indicated by Schumpeter the best as possible**. The first part of the answer is obvious but it is also crucial as the second now that the village is open. This openness is not only true in terms of its economic functioning i.e. its activities, investments allocation, input search and so on. But also in those featuring the circulation of information mainly economic. This means that many people gradually get informed about their standard of living compared to others or the conditions for them to get a job. At the end of the late century, this has begun creating problems. In industrialised countries, the U.S. being excepted, the concern for employment has increased while it was for poverty and its effects upon society in the rest of the world.

Indeed, available data showed that there was an unequal income distribution amongst people from the global village in the long run i.e. after accounting for the explosion of many waves of innovations and various sets of applied policies conducted by governments. And further data revealed also that growth had failed to eradicate poverty. In this case, A. Sen, the 2001 Nobel prize winner, demonstrated clearly in his books that growth without democracy would not eradicate poverty.

8. Let us just have in mind some data about the state of the world 's income in the long run i.e. from 1820 to 1998. Data come from works done by A. Maddison, published by OECD in the year 2001 (The world Economy-A Millennial Perspective). Figures show roughly two groups of countries. In group A, comprising Western Europe, the U.S., Canada, New Zealand and Australia, 19 multiply G.D.P. per capita (in international dollars of 1990). In group B, the rest of the countries, it is only multiplied by 5.4.On average, for the global village, the multiplication factor is 6.6. To be more precise, at the end of the XX Th, someone from group A enjoyed an income of about 21,470 dollars (1,130 in 1820) while another one from group B would only receive 3,102 dollars (573 in 1820), the world's average amount being 5,908 dollars (667 in 1820). Latin America 's figure is an average of 5,795 dollars (665 in 1820) with Brazil reaching 5,459 dollars (811 in 1 820). **The sharing of income behind these figures is the following: 14.2 % of the world' s population earns 53.4 % of the village' s income. In 1820, the figures were 16.8% of the population having 28.5% of the world's wealth.** So the rich countries became richer even if the poorer were less poor. It is worth indicating that group B comprises also many poors i.e. people living with less than two dollars a day. There are even people living with less than one dollar a day (about 900 millions people in 1820 and 1200 millions at the end of the XX Th). But the weight of these poor people in the total of world's population has strongly decreased from 90% to 20% at long run**. So not only there is income inequality in the village but there remain also people out from the monetary economics and its institutional framework. Therefore also its ways to be protected against the difficulties of living.**

9. The preceding information has led various groups of people all around the world to protest against a lonely world's model of organisation i.e. through economic functioning mainly as predicated by Fr. von Hayek, another famous Austrian thinker of the XX Th century. For these people open market economics or « the global age » is not the end of the story as once written by Fr. Fukuyama .It is not the way to get a global organisation for the village. Further, one has also to be concerned by the world's societies and their civilisations. An open village means that a global dialogue between these ones is not avoidable given the state of shared wealth featuring this village. Otherwise there are risks of clashes between societies (or more dangerously their civilisations) whichever the rationale of arguments might be. To come back on what was predicated to get growth within development is also one of the message given by J. E. Stiglitz, recent Nobel prize winner for Economy, in his last book « Globalisation and its Discontents »published in 2002 by Norton. (The document has been criticised .To get a balanced view one should also look at the reply by K.Rogoff, the IMF's chief economist. The relevant address to get the reply is the following: www.imf.org/ external/np/vc2002/070202.htm). Same message to change also sent by H.J.Chang from Cambridge (UK) University in a very recent book « Kicking Away the Ladder-Development Strategy in Historical Perspective »

(London, Anthem Press, June 2002). How to proceed to get new global perspectives has to be debated now, particularly in the framework of the Doha agenda? Indeed, at Doha, the changes to the growth process to get economic wealth in rich countries have not been discussed! An answer as to how this might operate is proposed at the following section. It comes from a research paper sent to the European convention. Its concern is how to revitalise democracy in Europe at a moment when it is enlarged and must face to new disequilibrium because of this move. A reader interested by the paper has only to click on the following address: european-convention@cec.eu.int, and then he has to click on the list of contributions to get it. The reader may also send a message to the author of the paper.

A new knowledge policy

10. Innovation as introduced in the beginning of this paper gives value to some activities and skills comparisons, the same being true for countries well endowed in these activities and skills. Therefore **the knowledge basis of innovation is privileged by market economics. But this knowledge is only a part of the knowledge a given society has according to its state of development at a certain moment of time**. Before the spread out of ICTs and PC, information to acquire is costful. Therefore, information is not naturally shared between the individuals of the enterprises. It is kept at some top level and goes down with some parsimony. The top level decides what the rest of the people have to do. To some extent enterprises form a military organisational structure because of the costs to get informed. R. Coase, the 1991 Nobel prize for Economy, explained that in a very interesting paper (The problem of social cost in Journal of Law and Economics, October1960) .In this case, the top level is also that which gives birth to a link between information and innovation. Indeed, in being informed, it decides how to react. Therefore, it may opt either for innovation or not. When information is abundant and cheap and markets open that freedom to innovate is no more the same. Indeed, enterprises, which do not innovate, have the risk of being cut out from the market with a high probability. Why? Just because other ones may choose to innovate departing from the same information which is easy to acquire. **The abundance of information creates pressure to do something with information, to innovate very often**. That abundance becomes a key factor to potential output. Instead of the « old » technology push to growth via physical investments, there is an information one through intangibles and innovations. Therefore, it also modifies the organisation. Indeed, one needs ideas to innovate. This is in favour of flattening the organisation. But this is not the end of the story. This is also in favour of a change to social relationships between people in firms. Indeed, one can order somebody to work but one cannot force him to think. Moreover to think requires understanding why. « Brains rather than brawns » promotes therefore a new social dialogue. It is unavoidable since not only information has to be shared with all people from the enterprise (compared to the past) but also it has to be well understood when one wants to get fruitful ideas and comments. This is particularly true when enterprises have to anticipate being proactive.
11. In the past, countries were catching – up, mainly in terms of labour productivity. Studies conducted at the OECD (by the Industry Committee for Industry and Business Environment), very recently have showed that this was less the case

since maybe the eighties. Ministers during OECD's ministerials have indicated their concern towards this situation. The concern is particularly relevant for Europe, which is in a process of enlargement. Indeed, available regional data indicate increased income inequality featuring the new political space. Further, on this one, cultural diversity would increase as well. This example, which has some analogy with the world 's situation, leads us to come back on what was said about market economics privileging some part of the knowledge a given society has and also therefore some countries compared to others. Indeed, when everybody enters into competition departing from the same basis of knowledge (which is the implicit target of predicted catching-up), the risks that the first ones would remain the winners is important. They have the core knowledge and the innovation culture according to which they can design the path where to get the others running. So the game is not fair departing from these resources. This is a fortiori true when all the competitors have not the same access to information. Past world's income results show the pertinence of the preceding remarks. Yes, it is possible to reduce the information fracture but that costs time and money assuming there is will. Furthermore, there is also an innovation fracture. To go from information to innovation requires input (intangible investments mainly) and entrepreneurship. Many countries have not or in abundance these resources. Moreover, as said by some people from the business community, **one needs also a new culture of work favourable to continuous change. To get it one must help people to achieve a better future. One solution to ease the transition is to get rid of the old predicament according to which scarce knowledge is predominantly valued. Why? Because when one promotes all the knowledge the society has one becomes in touch with human creativity. This is the key issue to get the expected innovation culture and through it to help people to build a new better future**. Further all needs will be also covered. This is also an excellent solution to help the civilisations ' dialogue the village needs since creativity is everywhere. Therefore this is the way to be on the intricacy between growth and civilisation everywhere. Let us shed some light on the proposed new knowledge policy.

12. **The new policy is an attempt to increase the spectrum of knowledge to be used by a society**. The following examples will show the global relevance of this policy, which therefore needs support from various forces of the society.
13. **Enterprise**. Each enterprise not only uses knowledge but also gives birth to knowledge. Indeed, each one enjoys various learning curves during its live. Very roughly, they show the relationship between information and behaviour. Information comes from the firm and its outside. The fitting comes from the strategy and its changes. This induces various changes within the firm. They are grouped into three families. The first one is called « outside –in ». It means that the applied policy to change has the aim to accommodate to markets' shocks by definition. The second is called « inside- out ». It aims at promoting changes to surprise markets. The third is a mix of the two preceding. In these three cases, knowledge is produced which may be precious for the future. Where is that knowledge explained, written and kept? Nowhere! In some cases, it is kept in special banks as relevant information towards mba teaching. But only a very small number of firms are then covered. And even in that case, linkages and their contexts, which make the difference between information and knowledge, are missing. The forgotten knowledge does not relate to a given enterprise only but also to its relationships with other ones. Therefore, it is part of the understanding

processes of cluster and enterpreneurship. It is in the core of regional attractiveness and relationships with neighbourhood regions Recent work done at OECD about territorial development has highlighted that framework. The Bologna conference in the year 2000 has also demonstrated that, for instance, in the case of the famous Italian districts. With that knowledge an enterprise is better-equipped facing competition and innovation. And also the area were it is located, but not all the time .To keep their knowledge util, enterprises must be concerned by it rather systematically and that during all their life spans. The same is true for public authorities giving support to enterprises and innovation. Therefore, public authorities and enterprises discover they must measure and value knowledge according to some criteria. In the case of enterprises, it is discovered that although their **knowledge is their real asset, their data give generally a very poor picture of this knowledge. That means their data reflect badly their real value**. This is a shame when the pressure of profit is strong and when there are profit bubbles. Indeed, in this case, there is some confusion between well-founded profit expectations and other ones. That confusion has been a heavy burden for many enterprises in recent past. It has also been the engine fuelling many shocks to the labour market and therefore the society's cohesion. In the case of public authorities, it is discovered that data lacks to conduct the expected new policy. In fact both at macro and micro levels all what features human capital has to be reinforced and completed whatever the spectrum of knowledge is.

14. **Citizen**. People carry on the knowledge, which has to be discovered and protected. Therefore, with the emphasis of the new policy, the concern for the transition to innovation and its results slides from enterprise to people. All brains matter. This is not only important to get a better climate inside firms but also to give a better chance for a person to be in continual employment even through changes to their work status. Indeed, the concern for knowledge might lead to ad hoc passport delivered within the enterprise. It will gradually be fulfilled by knowledge identified during the working time whichever the status of work is (full time, part time worker). The passport will also be applied to entrepreneur and trainee, in fact to each person whatever is its working status. The passport would not be limited to working periods. **The idea is to give each citizen the opportunity to get a knowledge passport summarising all his knowledge (i. e. not only to the labour market related one) which he will carry throughout his life.**
15. **Mobility**.The passport will be accepted in the European market. So it will give European citizens the best chance to get a job in that particular region.
16. **Enterpreneurship**.To get entrepreneurs, it is better to push up and protect a wide spectrum of knowledge than a only limited one. Indeed, many markets are full of competitors. Therefore, the chance to enter on these markets is small and difficult. Not only one needs seed capital and risk, but one must also be prepared to accommodate to many fluctuations, some being cultural. The late OECD forum about mergers and acquisitions for this year has showed that. People from the business community attending the forum have all indicated strategy developed by their corporations to face these shocks. Moreover, some countries are better equipped than others are to ease that entering. Paradoxically, international competitive markets do not fulfil all needs. So, the new policy offers the opportunity to make encountering the neglected needs or new ones by a new generation of entrepreneurs capitalising on the wider spectrum of knowledge. Obviously this move requires support from the society. The envisaged reform to

the legal system of social protection has this aim. It has to be reinforced with other measures favourable to a mix of working status a citizen might enjoy during his life. A proposal of research about how to push up this mix has been addressed to the unit of OECD working on SMEs and entrepreneurship.

17. **Society**. It is obvious to say that with the new knowledge policy each society from the global village is better equipped to push up innovation and growth. Indeed, what matters to get it is to be focusing on the intricacy of synergies of activities and skills. This is precisely the case. Abundant knowledge is at the core of this intricacy. Further, **the expected passport is a good pillar to life long education and training**. This will continuously reinforce the core of the growth process. It is proposed to appeal launching such a project with its funding as soon as possible. It will be accompanied by a reform of social protection so that any form of employment could induce the same legal protection whatever the status of work is. Therefore, **the passport is an aid given to everybody to secure their degree knowledge so as to achieve the best possible opportunities without loosing it some others**. This is good common sense since never any society had comprised only people having some privileged knowledge. Further, economic history reveals that all knowledge is legitimate given the complexity of society. **Some periods of history indicate moreover that when a concern for knowledge rises, creativity becomes more evident. It can also be shown that creativity exists in many forms**.
18. **Cursus**.It is worth indicating that the new knowledge policy is a key to modify cursus globally. Indeed, it helps to deal with the linkages of much knowledge. It avoids giving too great a weight to one concern (the economic one often) against the other ones.
19. **A real knowledge age**. By gradually illuminating contents and their contexts, all intricacy of knowledge, the aspects linked to « to have » and others to « to be » (creativity), the new policy **really helps societies from the village entering « the mankind's knowledge age » an age full of innovation of various sorts and synergies. This will induce many changes really difficult to anticipate, even just a little. In case of property rights, there will be change since many countries will have something to protect. In case of needed data to conduct consistent spectrum of policies there will be change too.**
20. **ICTs.**To focus on a wider spectrum of knowledge requires technologies to keep information about it and to use it. They exist but their availability is under constraint at the village level .In the framework of the proposed new policy a global effort should be made. **Indeed, as it has been explained, knowledge is the public good for a future of peace and better life for a majority of people whichever is their civilisation**. To give birth to it everywhere is therefore a key issue. But obviously a scale of priority has also to be determined in many countries since it is not possible to push up knowledge when basic needs are not fulfilled.
21. **Global issue**. The new policy is a powerful tool to change the global development issues. But obviously it requires support to be applied being well focused, designed and scaled. So it needs research. Therefore **an appeal is launched to get the funding giving birth to an international network of researchers** .All good wills are accepted. It must be possible to come up with something before the end of the Doha timing.